of the fifth black, the last with a narrow pale posterior margin; sixth segment and anal appendage sanguineous. Legs black. Rostrum about reaching posterior margin of second abdominal segment, black, with the apex somewhat paler.

Long. 12 millims.

Hab. Calabar.

Allied to *D. superstitiosus*, but differs in the colour of the antennæ, absence of black fascia to corium, &c.

EXPLANATION OF PLATE XXXI.

Fig. 1. *Halyomorpha versicolor* ♀, p. 271.
2. *Tyoma porrecta*, p. 271.
3. *Aspavia grandiuscula*, p. 272.
4. *Roscius circumdatus*, p. 275.
5. *Dysdercus antennatus*, p. 275.
6. *Aurivilliana lurida* ♂, p. 273.
7. —— —— ♀, p. 273.
8, 8*a*, *b*. *Petascelisca velutina* ♂, p. 273.
9. —— —— ♀, p. 273.
10, 10*a*, *b*. *Petascelisca foliaceipes* ♂, p. 274.
11. —— ——, ♀, p. 274.

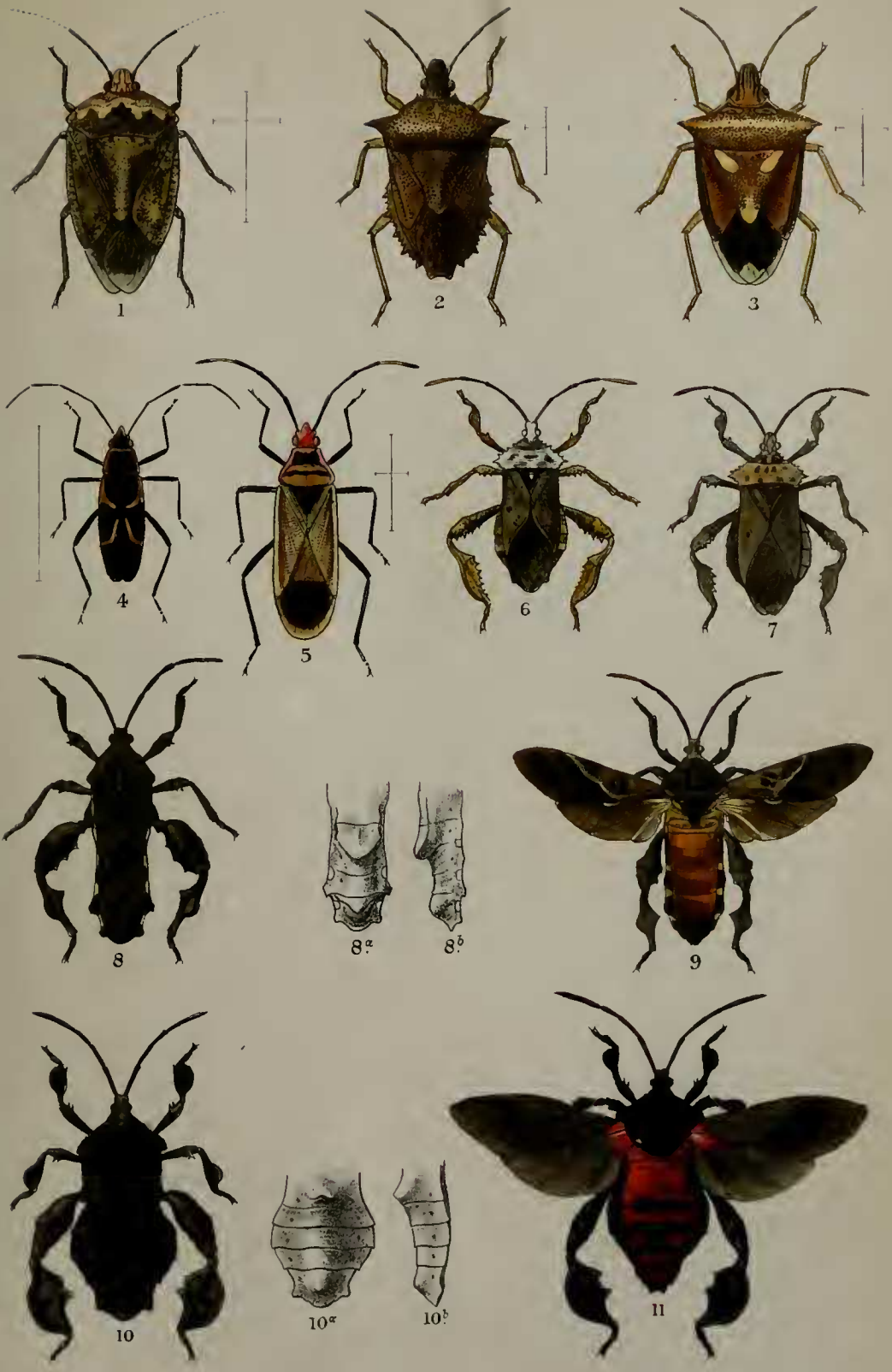
3. On a Collection of Shells from Lakes Tanganyika and Nyassa and other Localities in East Africa. By Edgar A. Smith.

[Received January 28, 1881.]

(Plates XXXII.–XXXIV.)

The collection of shells about to be described has been derived from three sources. Part of it was collected by the Rev. Edward Coode Hore; of Ujiji, and presented to the British Museum by his brother John Coode Hore, to whose liberality that institution owes the possession of the valuable collection which I had the pleasure of reporting upon in these 'Proceedings' last year. The second set, partly collected by Mr. Hore and in part by Dr. John Kirk of Zanzibar, was kindly consigned to the Museum by the latter. The third, and by far the largest, series was collected by Mr. Joseph Thomson, who has recently returned from an exploring expedition in Central Africa despatched by the Royal Geographical Society, whose council has placed the specimens in the national collection.

Among the species from Tanganyika are seventeen new to its fauna, of which eleven are undescribed. To three of these attaches the greatest interest; for they have all the appearance of being modified marine types. And such in all probability is the case; for Mr. Thomson informs me that in his opinion, judging from the geology of the neighbourhood, Tanganyika at some remote epoch has been an inland sea, the saltness of whose waters has almost entirely vanished, leaving only a peculiar taste which can scarcely be described as



W Purkiss lith

Hanhart imp

NEW AFRICAN RHYNCHOTA

brackish. The flavour is unpleasant; and when other water is procurable, that of the lake is not drunk by the natives.

Two of these most remarkable shells (*Limnotrochus thomsoni* and *L. kirki*) possess all the general outward aspect of the marine genera *Trochus* and *Echinella*; and the third has a wonderful resemblance to *Syrnola* in the Pyramidellidæ. Moreover *Melania nassa* (a very variable form) and *M. horei* (on the contrary, with very constant characters) have much more the look of marine than lacustrine species; and it is very probable that when their animals are known they will exhibit some anatomical differences which will necessitate their removal from the Melaniidæ. In describing the remarkable genus *Tiphobia* in my former paper I was unable to give any account of the operculum. Fortunately one of the specimens brought home by Mr. Thomson contains that appendage; and its structure shows that the species is Melanoid, as was originally surmised. The same defect in the description of the *Paludina*-like *Neothauma* is now supplied; for several of the specimens contain opercula, which prove to be similar to that of *Paludina*.

Altogether thirty species are now known to inhabit Tanganyika. Of these seventeen are apparently peculiar to it, nine having been recorded from other localities, chiefly more northward, in Nilotic regions. Two of these (*Limnæa natalensis* and *Melania tuberculata*) also occur in Lake Nyassa; and certain shells which appear to be varieties of *Corbicula radiata* and *Unio nyassaensis* also inhabit both lakes. Only two additional species are now included in the Nyassa fauna—one a new *Ampullaria* (a genus not previously recorded from that lake), the other the well-known *Lanistes purpureus*—thus raising the total number of its known species to twenty-seven.

Of the land-shells hereafter described I would call special attention to the *Bulimus notabilis*, quite unlike any other African form, and to *Streptaxis gigas* and *S. craveni*, the former being the giant of the genus.

1. Cyclophorus wahlbergi, Benson.

Cyclophorus wahlbergi, Pfeiffer, Con.-Cab. pl. 50. f. 17–19; Reeve, Con. Ic. f. 81.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

This well-known South-African form has not, I believe, been recorded from so northern a locality; but two other species which are very similar have been described:—one, *C. magilensis*, Craven, from Magila, which I think may prove to be only the young state of this species; and the other *C. hildebrandti*, Martens, from Ukamba, which, although in general aspect very like, still differs in its greater size and fewer whorls. In Reeve's figure the aperture is represented unusually large.

2. Cyclostoma insulare, Pfeiffer, var. (Plate XXXII. figs. 1, 1 *a*.)

Cyclostoma insulare, Pfeiffer, Proc. Zool. Soc. 1852, p. 64; Conchyl.-Cab. p. 351. no. 368, pl. 45. figs. 5, 6; Reeve, Con. Ic. fig. 41.

C. kraussianum, Reeve (non Pfr.), Con. Ic. fig. 52.

Var. = *C. lineatum*, Pfr. Con.-Cab. pl. 45. f. 3–4; Reeve, Con. Ic. f. 46?

Hab. Between Lake Nyassa and the east coast (*Thomson*).

The shells from the above locality differ in some respects from the typical form of this species, yet scarcely sufficiently and persistently to enable me to describe them as distinct. The main difference is that of form and in the size of the aperture. In the smallness of the latter, four of them correspond with what I believe is only a variety of this species, viz. *C. lineatum* of Pfeiffer. Two others are more depressed, and have the last whorl, umbilicus, and aperture unusually large. It may be as well to point out the fact (which as far as I know, has not been previously noticed) that the true *C. kraussianum* of Pfeiffer is a very distinct species from that which appears as such in the monograph by Reeve, who in its stead merely figures (pl. ix. fig. 52) a second example of the present species, which he correctly delineates on the previous plate (fig. 41). The shell represented by him (fig. 46) as *C. lineatum* is not the type described by Pfeiffer, which is accurately depicted by the latter author in the 'Conchylien-Cabinet.' I may also take this opportunity of pointing out that the *C. goudotianum* of Sowerby is a very distinct species from that figured by Pfeiffer (Conch.-Cab. pl. 13. figs. 8–10) under that name; also Reeve's figure (no. 42 *a*) correctly delineates the original type of the same species, but figure 42 *b* merely represents a smooth variety of the *C. insulare*. Although *C. goudotianum* is stated by the describer to have been collected in Natal by Dr. Krauss, I am of opinion that it will eventually prove to be a Madagascar species. In the expansion of the lip, its *tout ensemble*, and the presence of a colour band within the umbilicus (a feature not met with in species of this genus from South Africa, and which occurs in some from Madagascar and also in several species of *Helix* from that island) it calls to mind certain forms from the latter locality. The name (*insulare*) of this species is an unfortunate one; but until it is proved that it is without doubt distinct from the old *C. ligatum* it may be desirable to retain it.

3. Helix (Nanina?) nyassana. (Plate XXXII. figs. 2–2 *b*.)

Shell narrowly umbilicated, thin, depressed, keeled, rather glossy brownish horn-colour; spire shortly conical. Whorls $5\frac{1}{2}$, moderately convex, impressed beneath the suture, and depressed or shallowly channelled at the lower part immediately above the suture. Sculpture consisting of distinct and somewhat prominent lines of growth, crossed with close concentric microscopic striæ; last whorl large, keeled and angled above the middle, convex beneath; keel not acute; groove just above it distinct but not deep. Aperture obliquely lunate. Peristome thin, only expanded slightly over the umbilicus. Greatest diameter 25 millims., smallest 21; height 13; aperture 10 long, 13 broad.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

The spiral sculpture which adorns this very interesting shell is

very beautiful, but only visible under a powerful lens. It is a larger species than *H. pyramidea* of Martens, has fewer whorls, and is more depressed and carinate. The depression immediately above the keel of the body-whorl and above the suture in the upper volutions is an interesting feature. The west-coast species, which is known under the three names *H. pellucida*, Gould, *H. troglodytes*, Morelet, and *H. africana*, Pfeiffer, is very like this species. It is, however, more coarsely sculptured, with a less flattened spire and a less angulated body-whorl, and lacks the depression above the angle and on the upper volutions.

4. Helix (Trochonanina) mozambicensis, Pfeiffer, var.? (Plate XXXII. figs. 3, 3 *a*.)

Helix (*Trochonanina*) *mozambicensis*, Pfeiffer, P. Z. S. 1855, pl. 31. f. 9; Novitates Conch. iii. pl. 108. f. 1–3; var., figs. 4–6.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

Only a single specimen was brought home by Mr. Thomson from the above district. It is distinguished from all the specimens of this species which I have seen by the much greater width of the umbilicus, its coarser arcuate lines of growth, somewhat greater solidity of texture, and small size. It appears to be adult; yet its greatest diameter is only 11 millims., and its height scarcely 6. These measurements, in comparison with those of the variety *albopicta* described by Martens, are very small; for some specimens of the latter form attain a width of 19 millims., with a height ranging from 10 to 13. Other localities for this species are near the Albert-Nyanza lake, Zanzibar, Panjan, Kitui in Ukamba, and Tette.

5. Helix (Trochonanina) jenynsi, Pfeiffer.

Helix (*Trochonanina*) *jenynsi*, Pfeiffer, Reeve, Con. Ic. f. 979; Pfr. Con.-Cab. pl. 129. f. 23 & 24; Philippi, Abbild. ii. pl. 7. f. 8.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

This species has also been recorded from Zanzibar and Pangani.

The dimensions of the largest shell considerably exceed those of the originally described specimen. Its greatest diameter is 16 millims., and the height is $10\frac{1}{2}$.

6. Streptaxis gigas. (Plate XXXII. figs. 4, 4 *a*.)

Streptaxis gigas, E. A. Smith, Annals & Mag. Nat. Hist. ser. 5, vol. vi. p. 429 (1880).

Shell very large, white, widely umbilicated. Whorls 6, regularly increasing, rather convex, furnished with close, coarse, very arcuate costulæ extending from suture to suture; the latter are transversely striated on one side only, namely that nearest the aperture. Body-whorl glossy beneath the periphery, exhibiting faint lines of growth. Aperture large, sublunate; lip oblique, arcuate and prominent above, and very widely sinuated beneath, thin. Columella somewhat expanded at the upper part. Height 30 millims., diam. 33; aperture $17\frac{1}{2}$ long, 15 wide.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

The two specimens of this species are apparently both young, as the characteristic deviating body-whorl is not yet developed. The base is widely umbilicated, as in the Brazilian *S. candida*. When adult this must be the giant of the genus, and a most remarkable shell. The costulæ are strong, remarkably flexuous beneath the suture, and then obliquely arcuate across the whorls; what I have described as striæ upon the left side of them, or that last formed and nearest the aperture, is rather a kind of pitting.

7. Streptaxis craveni. (Plate XXXII. figs. 5, 5 *a*.)

Strepaxis craveni, E. A. Smith, Annals, *l. c.*

Shell narrowly umbilicated, obliquely distorted, smooth, glossy, dirty milky-whitish. Whorls 7, slightly convex, closely costulately striated beneath the suture. Last whorl suddenly descending in front, then rising somewhat upon the preceding whorl, very obliquely deviating. Aperture oblique, edentulate; outer lip (viewed laterally) sinuated at the suture, then prominently arcuate and oblique beneath, a little thickened and reflexed. Columella and basal margin thickened and narrowly reflexed, the former a trifle arcuated. Length from apex to base of aperture 29 millims.; diameter of last whorl 22; aperture 15 high, 12½ broad.

Hab. On hills between the mouth of the river Dana and Mombasa, East Africa (*Kirk*).

This is one of the finest species of *Streptaxis* yet discovered, and remarkable on account of the peculiar outline of the labrum, the smoothness and polish of its surface, and its large size. I have much pleasure in naming it after my friend Mr. A. E. Craven, who has contributed to our knowledge of the shells of the East-African region, and has also written a very important monograph of the microscopic genus *Sinusigera*, and other valuable contributions to conchological science.

8. Streptaxis mozambicensis. (Plate XXXII. figs. 6, 6 *a*.)

Streptaxis mozambicensis, E. A. Smith, Annals, *l. c.*

Shell small, linearly rimate, whitish, smooth, glossy. Whorls 6, convex, crenulated beneath the deep suture; last whorl oblique, of the same width as the preceding, descending in front, and briefly ascending at the aperture, a trifle flattened above the aperture; the latter circularly lunate, small, edentulate; outer lip a trifle arcuate viewed laterally, oblique, narrowly expanded. Columellar margin more broadly reflexed. Height 7½ millims., diameter of last whorl 4½; aperture 3 long, 2½ wide.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

This species is smaller and less distorted than *S. kirki*, Dohrn, and has merely a linear umbilical fissure. It is likewise smaller than *S. enneoides*, Martens, not perforate, smooth, and has more convex whorls.

9. Ennea obesa, Gibbons.

Buliminus obesa, Gibbons, Taylor's Quarterly Journ. of Conchol. vol. i. p. 255, pl. 2. f. 3.

Hab. Near Lake Nyassa, and between it and Dar es Salaam (*Thomson*); "Bawri Island, Zanzibar" (*Gibbons*).

This species appears to be a dwarf form of *E. ovoidea* from the island of Mayotte. The texture is waxy white and semitransparent; the peritreme is opaque white; and the suture is linearly margined. The body-whorl is somewhat flattened just above the aperture, and it ascends chiefly near the lip. The largest specimen from Nyassa is $28\frac{1}{2}$ millims. long and 13 broad.

10. Ennea lævigata, Dohrn. (Plate XXXII. fig. 6*.)

Ennea lævigata, Dohrn, Proc. Zool. Soc. 1865, p. 232; Pfeiffer, Monog. Helic. vol. v. p. 454.

Hab. Between Lake Nyassa and the east coast (*Thomson*); on a small rocky island in Lake Nyassa (*Kirk*).

Like several other species of *Ennea* this also varies much in size. Those described by Dohrn were $\frac{5}{16}$ inch long and $\frac{1}{8}$ broad, whilst the specimens collected by Mr. Thomson have a length of $\frac{7}{16}$ inch and a diameter of $\frac{3}{16}$.

11. Bulimus (Rhachis) braunsii, Martens. (Plate XXXII. figs. 7–7 *c*.)

Bulimus (*Rhachis*) *braunsii*, Martens, Von der Decken's Reise in Ost-Afrika, p. 151; Nachrichtsblatt der deutsch. malak. Gesellschaft, vol. i. 1869, p. 150; Pfeiffer, Novitat. Conch. vol. iv. pl. 118. f. 11, 12.

Var. *hildebrandti*, Martens, Monatsberichte Akad. Wissensch. zu Berlin, 1878, p. 294, pl. 2. f. 1, 2.

Hab. Between Lake Nyassa and the east coast (*Thomson*); Duruma (*Hildebrandt*); Zanzibar (*Brauns*); Uzanamo (*Capt. Speke*).

The colouring of the specimens which appear to belong to this species is very variable. In one instance it is of a uniform pale straw tint, with the exception that at the apex it is nearly black and in the umbilical region transparent horny. Two other specimens present markings such as were described originally by Martens, except that the apices are blacker and the two dark zones (one round the middle of the last whorl, and the other below it) are interrupted more or less, and these, together with the series of spots, are nearly black. In another specimen the series of spots flow into one another, thus forming stripes, and those on the lower half of the body-whorl are also confluent; and again, in another example, the two rows of spots on the upper part of the last whorl are wanting.

The specimens described by Martens from Zanzibar are said to have had the appearance of young shells, and the last whorl obtusely angulated; and in the variety *hildebrandti* it is characterized as *very* obtusely angulated. In the shells before me, which are larger than those referred to by Martens, the angulation is totally absent.

This may result merely from difference of age. The largest specimen collected by Mr. Thomson is 19½ millims. long and 9½ broad.

12. Bulimus notabilis. (Plate XXXII. fig. 8.)

Bulimus notabilis, E. A. Smith, Ann. & Mag. Nat. Hist. ser. 5, vol. vi. p. 427 (1880).

Shell elongate-ovate, deeply and widely umbilicated, of a uniform light brown colour. Whorls 8 in number, slowly enlarging, moderately convex, sculptured with very fine, close-set, slightly oblique and feebly flexuous liræ or raised lines of growth. Suture simple, almost horizontal. Last volution convex, exhibiting a very faint indication of a median angulation or almost obsolete carina. Aperture irregularly ovate, subauriform, rather acuminate both above and at the base, where it is channelled, pinkish or pinkish brown within. Umbilicus broad, pervious to the apex, surrounded by an obtuse ridge. Peristome whitish, not thickened; outer margin (viewed laterally) oblique, scarcely arcuate, a trifle prominent in the middle, not reflexed or expanded; columellar margin broadly expanded, arcuate, its upper extremity united to the superior termination of the outer lip by a thin callosity. Length 43 millims., diameter of last whorl 20; aperture 17½ long, 11 wide.

Hab. Between Lake Nyassa and the east coast (*Thomson*).

The peculiarity of the basal canaliculation of the aperture affords an interesting intermediate grade between this genus and *Achatina*.

13. Bulimus (Buliminus) kirki, Dohrn. (Plate XXXII. fig. 9.)

Buliminus kirkii, Dohrn, Proc. Zool. Soc. 1865, p. 232; Martens, Decken's Reisen in Ost-Afrika, vol. iii. p. 150.

Hab. Between Lake Nyassa and east coast (*Thomson*).

This species was originally collected by Dr. Kirk at Cabaceira in Mozambique, and subsequently by Mr. A. E. Craven at Magila.

14. Achatina hamillei, Petit. (Plate XXXII. fig. 10.)

A. hamillei, Petit, Journ. de Conch. 1858, vol. vii. p. 384, pl. 13. f. 3.

Shell large, ovate, acuminate above; spire whitish, striped obliquely with brown; last whorl purplish, striped at intervals and covered with an olive epidermis. Sculpture granose, consisting of coarse oblique lines of growth, which are very coarse beneath the suture, crossed by spiral impressed lines. Whorls 8, moderately convex. Aperture inversely subauriform, a trifle longer than the spire, bluish white within. Peristome thin, margined within with purplish brown. Columella thickened, white, not very arcuate or contorted, somewhat abruptly truncated, united to the lip above by a thickish white callosity. Length 130 millims., diam. 62; aperture 69 long, 40 wide.

Hab. Usambara (*Dr. J. Kirk*); West Africa (*Petit*).

The spire of this shell is very like that of *A. petersi*, Martens. The latter, however, is a smaller species, if the dimensions given by

the author are those of an adult specimen; and the aperture is proportionally longer. In the present species the coloration is rather different, and the epidermis is of an olive tint instead of rich fulvous brown.

15. Achatina craveni. (Plate XXXIII. fig. 11.)

Achatina kirkii, E. A. Smith, Ann. & Mag. Nat. Hist. 1880, vol. vi. p. 428.

Shell elongate ovate, somewhat acuminate above, beneath a yellowish epidermis white, ornamented with suberect, slightly wavy, brown stripes. Whorls 8–9, rather convex, rather coarsely granosely sculptured; suture between upper whorls horizontal, between two last more oblique; last whorl descending, smoother upon the lower part. Aperture subpyriform, bluish white, occupying less than half the shell. Columella not much arcuated, whitish, rather abruptly truncated, connected with the upper extremity of the outer lip by a thin callosity. Length 81 millims., diam. 37; aperture 39 long, 20 wide.

Hab. Between Zanzibar and Lake Tanganyika (*Kirk*).

The granose surface of this species is the result of the coarse raised lines of growth being crossed by transverse impressed striæ, which being somewhat remote from one another cause the granules to assume a rather elongate form. Mr. Alfred E. Craven informs me that the distinguished name of Dr. Kirk has already last year been associated with a species of this genus. Such being the case, I am compelled to alter the designation originally applied to this species; and therefore I have much pleasure in substituting that of *A. craveni*.

16. Achatina thomsoni. (Plate XXXIII. fig. 12.)

Achatina thomsoni, E. A. Smith, Annals, loc. cit.

Shell moderately solid, elongate ovate, beneath a yellow epidermis whitish, striped with blackish brown. Spire sometimes purplish red or whitish, more or less worn, and in consequence, to a certain extent, lacking the striping; the latter is, as a rule, rather regular and only a little wavy. Whorls 7, a little convex, striated by the lines of growth, covered by a thin yellow epidermis, which is beautifully sculptured with most minute striæ in a crisscross fashion, producing the woven appearance of a fabric; last whorl elongate, narrow, gradually descending. Aperture pyriform, bluish white. Columella arcuate, thickened, not very abruptly truncated at the base, united to the lip by a thin callosity. Length 75 millims., diam. 32; aperture 38 long, 21 broad.

Hab. Between Lake Nyassa and east coast (*Thomson*).

This species is remarkable for its narrow ovate form and the peculiar woven appearance of its epidermis. The proportion of the length of the aperture to that of the entire shell varies; in some specimens it occupies rather more than half the total length, and in others somewhat less. The deep-brown or black stripes edged with brown, as a rule, occupy more of the surface than the yellow spaces

between, and, although somewhat wavy (upon the last whorl especially), do not take a large zigzag pattern. Most specimens are more or less streaked with opaque golden lines in the direction of the lines of increment, which when falling upon the dark stripes tell very vividly.

17. Achatina (Limicolaria) caillaudi, Pfeiffer. (Plate XXXIII. fig. 13.)

Achatina (*Limicolaria*) *caillaudi*, Pfeiffer, Zeitsch. f. Mal. 1850, p. 86; Mon. Hel. vol. iii. p. 386, vol. iv. p. 584, vol. vi. p. 208; Martens, Mal. Blät. 1865, vol. xii. p. 197.

Hab. Near Lake Tanganyika (*Thomson*).

This species varies greatly in breadth and length, as may be judged from the measurements given by Martens in the work above mentioned. One of the specimens from Tanganyika is remarkably slender, having a length of 71 millims. and a diameter of 20, the aperture being 21 long. The species has not hitherto been recorded from so southern a region.

18. Achatina (Limicolaria) rectistrigata, Smith. (Plate XXXIII. figs. 14, 14 *a*.)

Achatina (*Limicolaria*) *rectistrigata*, Smith, Proc. Zool. Soc. 1880, p. 346, pl. xxxi. fig. 2.

Hab. Near Lake Tanganyika (*Thomson*).

Additional specimens show that this species varies considerably in form and the relative proportion of the whorls to one another; but the regularity of the striping is still maintained. Besides the lines of increment, some examples are ornamented with spiral striation upon the upper whorls, which produces a subgranose appearance. The following measurements will best demonstrate the variation of form :—

Length	39	millims.,	diam.	17,	aperture	14	long.
,,	39	,,	,,	$16\frac{1}{2}$,	,,	15	,,
,,	44	,,	,,	17,	,,	16	,,
,,	41	,,	,,	14,	,,	14	,,

The last measurements are of a specimen from near Ujiji, sent by Dr. Kirk to the British Museum, and received by him from Mr. Hore.

19. Subulina lenta. (Plate XXXIII. fig. 15.)

Subulina lenta, Smith, Ann. & Mag. Nat. Hist. ser. 5, vol. vi. p. 428 (1880).

Shell subulate, imperforate, very slowly enlarging, very elongate and narrow. Whorls —? (probably 11 or 12), very slightly convex, covered with a thin, glossy, pale olivaceous epidermis, varied at intervals with darker oblique stripes. Suture simple, rather oblique and deepish. Sculpture consisting of fine oblique and feebly flexuous lines of increment, faintly puckered at the upper extremity. Aperture small, occupying less than one fifth of the entire

length. Columella very arcuate, abruptly truncated at the lower extremity. Probable length 41 millims., actual length of seven remaining whorls 36 ; diameter of last whorl $7\frac{1}{2}$, of penultimate 7, of antepenultimate $6\frac{1}{3}$; aperture $7\frac{1}{2}$ long, 4 broad.

Hab. Near Lake Tanganyika (*Thomson*).

The brevity of the aperture in proportion to the total length of the shell, its narrow elongate form, and the slow increase of the whorls constitute the chief characteristics of this species. *Spiraxis bistorta* of Pfeiffer has a considerable resemblance to it, but has more convex whorls, a longer aperture, and a different columella.

20. Subulina solidiuscula. (Plate XXXIII. fig. 16.)

Subulina solidiuscula, Smith, Ann. & Mag. N. H. 1880, vi. p. 428.

Shell elongate, subulate, rather solid, imperforate, white, covered with a thin olivaceous epidermis, obliquely striated by the lines of growth, which are crossed by shallow spiral striæ, producing a somewhat granose or wrinkled surface. Lateral outlines rectilinear, slowly converging. Apex obtuse, truncated. Remaining whorls 8 in number, very slightly convex and slowly increasing, separated by a rather horizontal, simple, distinct suture. Aperture short, and the columella curved. Probable length of a perfect specimen 52 millims.; actual length of shell, consisting of eight volutions, 43 millims., diam. 11 ; aperture 9 long, $5\frac{1}{2}$ broad.

Hab. Near Lake Tanganyika (*Thomson*).

Of this interesting species only a single specimen was obtained. It is comparatively solid for a shell of this genus, and also remarkable on account of the very elongate form and the exceptionally slow increase of the volutions. The apex of the shell is obtusely truncated, but this may be the result of an accident in this instance, and not a constant specific character. The spiral or transverse striæ are but feebly impressed, but crossing the fine lines of growth give them a crinkled appearance.

Limnotrochus.

Limnotrochus, Smith, ibid. p. 425.

Shell trochoid, umbilicated, without an epidermis, spirally ridged. Body-whorl keeled round the middle. Aperture non-lirate within, with the outer lip oblique, the basal margin broadly sinuated, and the columella-edge somewhat reflexed and united to the labrum above by a callosity. Operculum horny, paucispiral, littorinoid.

This remarkable form has all the appearance of a *Trochus* when viewed with the aperture from the eye. It is, however, more closely related to the Littorinidæ, and exhibits the greatest affinity with the genus *Echinella*, from which, however, it may be distinguished by its operculum and the broad shallow sinuation in the lower margin of the aperture.

21. Limnotrochus thomsoni. (Plate XXXIII. figs. 17–17*b*.)

Limnotrochus thomsoni, Smith, loc. cit.

Shell moderately solid, narrowly umbilicated, trochiform, livid

purplish dotted with brown, whitish at the suture and at the base. Spire acutely conical, with rectilinear outlines. Whorls 7, flat, sloping, with a broad deep furrow at the lower part, which is margined above by a keel, which on the upper volutions is simple, remarkably prominent and acute, and giving to them quite a pagoda-like appearance. On the last two and a half whorls it is less acute and minutely nodulous; and above that there are three other granulous ridges, whereof the uppermost, or that immediately beneath the suture, is conspicuously the largest; these gradually become finer and less granulous as they ascend the spire, so that upon the first few whorls they are simple thread-like liræ; the last whorls also exhibit fine liræ of a similar character between the larger granulous keels, and the entire surface is ornamented with very fine lines of growth. The body-whorl is sharply angulated and carinate at the middle; and the slightly convex base bears about eight principal concentric ridges with interlying finer thread-like ones. Aperture subquadrangular, within purplish at the upper part and whitish beneath, equalling about $\frac{5}{12}$ of the entire length of the shell. Outer lip thin, obliquely receding, a little incurved above the carina, not thickened. Basal margin broadly sinuated, excurved, and slightly effuse. Columella thin, arcuate, a trifle reflexed at the umbilicus, and joined to the upper extremity of the labrum by a thin white callosity. Operculum horny brown, about 5-whorled, distinctly marked with arcuate lines of growth. Length 18 millims., diam. 11; aperture $7\frac{1}{2}$ long, 6 broad.

Hab. Lake Tanganyika (*Thomson*).

I feel much pleasure in naming this species after Mr. Thomson, its discoverer. Among the several forms new to science contained in his collection this is perhaps the most remarkable. The colour of it is very difficult of description. The general tone of the spire is a sort of livid purplish tint, divided into zones by the whitish furrow which encircles the whorls immediately above the suture. The tubercles, too, upon the ridges also stand out in pale relief; and the interstices between them are frequently dotted with brown. The keel around the middle of the body-whorl is scarcely tuberculous, or at all events much less so than the carinæ above. The base is almost entirely white, with the exception of red dotting sometimes present upon some of the larger ridges, which exhibit hardly any indication of tubercles. The effuse broad sinuation in the base of the aperture is best seen when the base of the shell confronts the eye.

22. Limnotrochus kirki. (Plate XXXIII. figs. 18–18 *b*.)

Limnotrochus kirkii, Smith, Ann. & Mag. N. H. 1880, vi. p. 426.

Shell solid, trochoid, dirty whitish, deeply and narrowly umbilicated. Spire acutely conical. Whorls 6 or 7, feebly concave, bearing arcuate and flexuous lines of growth and six or seven granulous liræ, whereof that immediately above the suture is the largest; body-whorl acutely angular at the periphery, encircled by two sub-

equal granular ridges. Base concave near the circumference, then slightly convex, concentrically granosely ridged, the ridges nearest the umbilicus coarser than the others, and also arcuately radiately striated. Aperture irregularly subcircular, whitish. Outer lip (viewed laterally) obliquely incurved. Basal and columellar margins forming one strongly arcuate line joined above to the extremity of the labrum by a thickish callosity. Operculum unknown. Length 15 millims., greatest diameter 18.

Hab. Lake Tanganyika (*E. Coode Hore*).

This is perhaps the most remarkable shell of the entire collection. It is perfectly trochiform in general appearance; and the character of its sculpture agrees with that which obtains in many species of that family. I have much pleasure in associating with it the name of Dr. John Kirk, who has been a most liberal donor of specimens to the Museum, and has done much to advance our knowledge of the fauna and flora of East Africa.

23. Lithoglyphus zonatus, Woodward.

Lithoglyphus zonatus, Woodward, Proc. Zool. Soc. 1859, p. 349, pl. 47. f. 3–30; Smith, P. Z. S. 1880, p. 350.

Hab. Lake Tanganyika (*Thomson*).

Several specimens of this species tend to show that it is subject to little variation, the only difference of any importance consisting in the greater or less contraction of the last volution and the consequent increase or decrease in the size of the aperture.

24. Lithoglyphus neritinoides. (Plate XXXIII. fig. 19.)

Lithoglyphus neritinoides, Smith, Ann. & Mag. N. H. 1880, vi. p. 426.

Shell ovate, imperforate, thinnish, smooth. Spire short, purplish, whitish beneath the suture. Whorls 4, convex; last one large, elongate, semitransparent, whitish, covered with an intensely thin subolivaceous epidermis, ornamented with thread-like transverse red lines. Aperture inversely pyriform, occupying a little less than $\frac{5}{6}$ of the entire length of the shell. Outer lip thin. Columella coated with a large callosity, extending from the upper extremity of the labrum to the base of the aperture, and spread considerably over the whorl in the umbilical region. Operculum unknown. Length $6\frac{1}{2}$ millims., greatest diameter 5; aperture 5 long, 3 broad.

Hab. Lake Tanganyika (*Thomson*).

This species resembles *L. rufofilosus* in its style of ornamentation only, in other respects being totally distinct. The form reminds one of certain small species of *Neritina*; and on that account the specific name selected bears reference to that genus. The great development of the columellar callosity is very remarkable. All three specimens exhibit a dark transverse stain on the back of the body-whorl at a short distance from the suture; but whether or not this is a permanent character requires more examples in proof.

25. LITHOGLYPHUS RUFOFILOSUS. (Plate XXXIII. figs. 20, 20*a*.)

Lithoglyphus rufofilosus, Smith, Ann. & Mag. N. H. 1880, vi. p. 426.

Shell globose, thick, rimate, white, encircled with very fine, thread-like red lines, covered with a very thin epidermis. Whorls $5\frac{1}{2}$, rapidly increasing, convex, separated by a simple deepish suture, striated by the lines of growth; last whorl large, globose. Aperture also large, inversely rather pyriform, whitish, occupying about $\frac{7}{9}$ of the entire length of the shell. Peristome continuous. Outer lip thin; base and columella thickened, the latter particularly so, and reflexed. Length 13 millims., greatest diameter $11\frac{1}{2}$; aperture $10\frac{1}{2}$ long, 6 broad.

Operculum dark brown, ovate, straighter on the inner or columellar side, paucispiral in the centre, which portion is surrounded by concentric layers.

Hab. Lake Tanganyika (*Thomson*).

The operculum of this species resembles that of *Tiphobia* in miniature. The centre of it is paucispiral or littorinoid; and this part is inclosed by a border which apparently consists of concentric layers. The number and distance apart of the thin red lines are subject to variation, one specimen having as many as twelve upon the body-whorl, and another as few as four.

SYRNOLOPSIS.

Syrnolopsis, Smith, Ann. & Mag. Nat. Hist. ser. 5, vol. vi. p. 426 (1880).

Shell subulate, smooth, imperforate. Aperture broadly sinuated at the base, with the outer lip slightly thickened, widely sinuated in the middle, and produced towards the lower part, furnished far within with one or two prominent liræ. Columella thickened, with a distinct plait at the upper part, and joined to the upper extremity of the labrum by a thin callosity. Operculum unknown.

This curious form has all the appearance of a marine genus, in fact closely resembling *Obeliscus* or *Syrnola*. The basal sinuation of the aperture is similar to that in some species of *Rissoina*; but the plication on the columella is wanting in that group. This is not very prominent in the adult shell; nor are the two liræ within the aperture visible, except through the semitransparent shell, unless the lip is broken away. On removing a portion of it these become apparent, the upper one being the thicker and extending parallel with the suture for about the distance of half a whorl, the lower one being shorter and more slender. The fold on the columella becomes remarkably prominent as it ascends the spire; and this may be observed by grinding off one side of the shell. As nothing is known of the animal, the systematic position of the genus is doubtful; however, it may temporarily be classed with the Rissoidæ.

26. SYRNOLOPSIS LACUSTRIS. (Plate XXXIII. figs. 21–21 *b*.)

Syrnolopsis lacustris, Smith, loc. cit.

Shell smooth, glossy, elongate, subulate, imperforate, yellowish

horn-colour, banded with white beneath the suture. Whorls 12; first two or three convex, the rest nearly flat, slowly increasing, finely striated by the very flexuous lines of growth. Suture simple, hardly oblique. Aperture small, occupying nearly $\frac{1}{4}$ of the total length. Labrum and columella as above described. Length $11\frac{1}{2}$ millims., diam. 3; aperture 3 long, 2 broad.

Hab. Lake Tanganyika (*Thomson*).

Besides the lines of growth, some species show traces of spiral striation.

27. Ampullaria gradata, sp. nov. (Plate XXXIII. figs. 22, 22 *a*.)

Shell globose, narrowly umbilicated, rather thin, moderately glossy, sculptured with oblique distinct lines of growth and minute spiral striæ invisible to the naked eye, yellowish olive, with several bands and lines of a greenish tint. Whorls 6, depressed and flattened above, convex at the sides. Spire gradated, worn at the purplish-brown apex, equalling about one fourth of the total length. Aperture pyriform, whitish within at the upper part, and light brown elsewhere, with the bands and lines of a vivid dark brown colour: those on the upper part stop short at a little distance from the margin of the lip, leaving a narrow space of a sulphur colour; those lower down extend almost to the edge, where they are particularly bright. Lip thin, with scarcely any internal thickening. *Columella below the umbilicus well curved*, expanded, yellowish, connected with the upper extremity of the labrum by a very thin callosity.

The following are the measurements of the three largest specimens:—

Length. millim.	Greatest diameter. millim.	Length of aperture. millim.	Width. millim.
78	72	58	37
73	67	58	36
82	72	60	38

Hab. Lake Nyassa, and between it and the east coast (*Thomson*).

The affinities of this species, if it be distinct, are rather with those forms found in Nilotic regions than with *A. speciosa* of Philippi from Zanzibar. The four species *A. wernei*, Philippi, *A. kordofana*, Parreyss, *A. lucida*, Parreyss, and *A. ovata*, Olivier, are very closely related; and it is a matter of impossibility to define the limiting characters of any of them. The present species also may only be another form of the same shell. Like *A. wernei* and *A. kordofana*, the whorls are flattened at the top, so that the spire has a gradated appearance; but from these it may be distinguished by its broader and shorter aperture and the considerably greater arcuation or incurvation of the columella; or the form may be described as more pyriform, being narrower above and broader below than in either of those two species. The banding within is of a deep tortoiseshell brown, and only extends to the margin of the tip, along the base, and about halfway up the side.

28. Lanistes purpureus, Jonas.

Ampullaria purpurea, Jonas, Archiv f. Naturgesch. 1839, p. 342, pl. 10. f. 1; Philippi, Conch.-Cab. p. 22, pl. 6. fig. 1.

Bulimus tristis, Jay, Cat. Shells, p. 121, pl. 7. fig. 1.

Meladomus olivaceus, H. & A. (non *Paludina olivacea*, Sowerby), Genera, vol. i. p. 349, vol. iii. pl. 37. f. 6–6 *b*.

Meladomus bulimoides, Swainson, Treatise on Malacology, 1840, p. 340 (probably).

Hab. Lake Nyassa, and between it and the east coast (*Thomson*).

One specimen from the lake differs from the normal form of the species in having the whorls flatter and the lines of growth somewhat puckered beneath the suture. Another shell, found further eastward, has a very unusually conical form, with the volutions also exceptionally flat.

The species appears to be very abundant at Zanzibar, and has also been found in many localities further south, in Mozambique.

29. Lanistes affinis, Smith. (Plate XXXIV. fig. 23.)

Lanistes affinis, Smith, Proc. Zool. Soc. 1877, p. 716, pl. 74. fig. 7.

Hab. Lake Nyassa (*Simons* & *Thomson*).

When I described this species I had but a single shell before me, which now proves to be only a small example of it.

The series brought home by Mr. Thomson show that it attains a considerably larger size. The finest specimen is 60 millims. in length, and has a considerable part of the surface strongly malleated, which, judging from the rest of the specimens, appears to be quite an exceptional feature. But one constant character, which may serve to part it from its congeners, is the narrow orange-yellow line which borders the volutions immediately beneath the suture. *L. ovum*, Peters, has a more elevated spire and smaller aperture; and *L. ellipticus*, Martens, appears to be (judging from the figure, Novitates Conchol. vol. ii. pl. 70. figs. 9, 10) more narrowly umbilicated, with the last whorl and aperture considerably narrower at the base. The penultimate whorl, too, of the latter is very narrow in proportion to the body-whorl.

The operculum is very thin, pale, horny, and considerably smaller than the aperture. The odontophore extracted from the dried remains of an animal agrees exactly with that of *L. ovum* (Troschel, 'Gebiss der Schnecken', vol. i. p. 90, pl. 6. fig. 11).

30. Lanistes, sp., jun.

Hab. Lake Tanganyika (*Thomson*).

Only a single immature specimen of a species of this genus was found. This is the first record of its occurrence in the lake.

The specimen has a depressed spire, but not so flattened as *L. nyassanus*, is rather widely umbilicated, and consists of three whorls. It closely resembles the apical portion of *L. solida* described by me from Lake Nyassa.

31. Melania (Sermyla) admirabilis. (Plate XXXIV. fig. 24.)

Melania (*Sermyla*) *admirabilis*, Smith, Ann. & Mag. N. H. 1880, vi. p. 427.

Shell elongate, thick, turreted, whitish, stained by a brownish earthy deposit. Whorls probably about 10, very convex, and much constricted beneath at the oblique very deep suture, unequally bipartite by a shallow furrow a little beneath the suture, bearing strong obliquely arcuate ribs, which at the upper end terminate in a tubercle above the shallow groove which crosses them; they vary in number considerably, in one specimen numbering as few as fifteen on the last whorl, and in another as many as twenty-one; last whorl with the costæ abruptly terminating at the middle, beneath which it is girded by five or six strong concentric liræ, which are of equal thickness and equidistant. Aperture ovate, acuminate above, narrowed and effuse at the base. Columella oblique, arcuate at the lower part, thickened and united to the upper end of the outer lip by a thin callosity. Length 47 millims., diameter 14; aperture 14 long and 8 wide.

Hab. Lake Tanganyika (*E. Coode Hore*).

This species is remarkable for its solidity, and the strength of the costation.

32. Melania tuberculata, Müller.

Hab. Lake Tanganyika (*Thomson*).

Again this ubiquitous species presents itself. It is without a rival in the extent of its geographical distribution, having been recorded from Malta, North, East, and West Africa, Lake Nyassa, Madagascar, Mauritius, Syria, Ceylon, Persia, Arabia, Mesopotamia, Siam, Java, island of Formosa, and Australia. The Tanganyika specimen is rather strongly cancellated, and exhibits the red dotting upon the transverse or spiral ridges.

33. Melania tanganyicensis. (Plate XXXIV. fig. 25.)

Melania tanganyicensis, Smith, Annals, loc. cit.

Shell small, turreted, solid, almost black, with a broad light-chestnut band occupying the middle of the whorls; these are about six in number, flat at the sides, and roundly shouldered above, strongly ribbed, the ribs being broad but not much elevated; the body-whorl is large in proportion to the rest of the shell, and has a few transverse sulci at the base. Aperture almost half as long as the entire shell. Columella well curved, pale and thickened towards the base. Length $7\frac{1}{2}$ millims., diam. $2\frac{3}{4}$; aperture $3\frac{1}{2}$ long.

Hab. Lake Tanganyika (*Thomson*).

In this instance also the species is represented by a single specimen only; and that too is in worn condition. Its characters, however, are such that it can readily be recognized from allied forms, none of which approximate very closely. Certain varieties of *M. polymorpha*, a Nyassa species, exhibit a close relationship in form,

but differences of coloration and sculpture. *M. tanganyicensis* has the upper part of the whorls of the spire somewhat swollen and almost black, the lower half being light chestnut, the black portion beneath this in each whorl being concealed by the upper part of the succeeding volution.

34. Melania (Melanella) nassa, Woodward. (Plate XXXIV. figs. 26–26 *b*.)

Melania (*Melanella*) *nassa*, Woodward, P. Z. S. 1859, p. 349, pl. 47, f. 1 ; Smith, P.Z.S. 1880, p. 348 ; Reeve, Con. Icon. fig. 216 ; Brot, Con.-Cab. pl. 6. f. 7.

This Tanganyikan shell is subject to much variation, both in form and sculpture. The number of plicæ in two of the specimens collected by Mr. Thomson is exceptionally small, there being but ten upon the last whorl. In contrast to this another example has twenty-six upon the same volution. One of the two former is also abnormal in another respect, namely in having the transverse ridges very narrow, thread-like, continuous on and between the plications, and of a brown colour. In the other they are whitish, interrupted by brown dots upon the lower part of the last whorl. The solid marine character of this species distinguishes it from all others, and when the operculum, at present unknown, and the animal are examined, it will probably receive distinct generic rank.

Since writing the above, another series of this remarkable species has been sent to the Museum by Dr. Kirk of Zanzibar. Among this set are some exceptionally large specimens, peculiar also for a subtruncation near the base of the columella. This I imagine would be concealed when the shell arrived at maturity by a deposition of callus. Although of very large size, not one of these appears to be adult, judging from the thickness of the outer lip. The number of transverse liræ on the last whorl is unusually large ; and the whorls are broadly and flatly gradated.

35. Melania (——?) horei. (Plate XXXIV. fig. 27.)

Melania (——?) *horei*, Smith, Annals & Mag. Nat. Hist. ser. 5, vol. vi. p. 427 (1880).

Shell ovate-conical, smooth, brown, with a narrow white line beneath the suture. Spire conical, a trifle excentric, inclining very slightly to the right (the aperture being towards the eye and downwards). Whorls $6\frac{1}{2}$, scarcely convex, exhibiting faint incremental striæ. Suture simple ; last whorl rising somewhat upon the preceding near the aperture, then suddenly descending to the margin of the labrum, furnished with a slight basal thickening, aperture ovate, rather acuminate above, purplish brown, occupying about $\frac{3}{7}$ of the entire length. Lip a little thickened, especially towards the suture, and somewhat patulate near the base. Columella whitish, moderately arcuate, united to the upper extremity of the labrum by a thin callosity. Length 14 millims., diam. $6\frac{1}{2}$; aperture 6 long, 4 broad.

Hab. Lake Tanganyika (*Hore*).

This is another instance of a species from Tanganyika having very much the appearance of a marine form. At present the operculum and animal are unknown; and therefore I place it provisionally in the genus *Melania*; for it approaches in some respects certain aberrant forms of that group, *e. g. M. brevis*, d'Orbigny, and *M. parva*, Lea.

The colour is not uniform in tint; for beneath the whitish infrasutural line the brown is paler, then comes a darker zone gradually blending into a paler one. The body-whorl too has an ill-defined basal zone.

36. Tiphobia horei, Smith. (Plate XXXIV. fig. 28.)

Tiphobia horei, Smith, Proc. Zool. Soc. 1880, p. 348, pl. 31. f. 6–6*b*.

When describing this very remarkable form, I was unable to give any account of the operculum. Fortunately, one of the specimens brought home by Mr. Thomson had that appendage adhering to the interior. It is almost black, horny, elongate-subovate, rather concave exteriorly, paucispiral in the centre, which portion is surrounded by apparently concentric layers. The lower side has a glossy border, which is broadest on the outer margin, narrow and slightly thickened on the inner or columellar edge.

It is not sufficiently large to close the aperture of the shell as in the genus *Paludina*; and the paucispiral character of the early stage of its growth confirms my original opinion that the species should be classed with the Melaniidæ. It is by no means a common shell according to the observation of Mr. Thomson, being restricted to a certain part of the lake, and even there not abundant. The absence of an epidermis is still maintained in the specimens now under examination; and this very remarkable peculiarity may be considered eventually a sufficient distinction to separate the genus from the Melaniidæ.

37. Neothauma tanganyicense, Smith.

Neothauma tanganyicense, Smith, Proc. Zool. Soc. 1880, p. 349, pl. 31. figs. 7–7*c*.

In this instance also I am enabled to give an account of the operculum. It is of a reddish colour, and normally paludinoid, the nucleus being situated about midway between the inner or columellar border and the centre. One of the specimens is unusually acutely carinate around the centre of the body-whorl, and very deep in the suture.

38. Paludina capillata, Frauenfeld.

Paludina capillata, Frauenfeld, Proc. Zool. Soc. 1865, p. 659; 1877, p. 717, pl. 74. figs. 3–4.

Hab. Lake Nyassa (*Kirk*); between it and the east coast (*Thomson*).

39. Paludina robertsoni, Frauenfeld.

Paludina robertsoni, Frauenfeld, P. Z. S. 1865, p. 659; Smith, P. Z. S. 1877, p. 717, pl. 74. f. 5, 6.

Hab. Same as the preceding.

The specimens collected by Mr. Thomson are greenish olive, with the angulation of the whorls strongly marked, and the columella of a bluish tint.

40. Paludomus ferrugineus, Lea. (Plate XXXIV. fig. 29.)

Melania ferruginea, Lea, Proc. Zool. Soc. 1850, p. 182; Reeve, Con. Icon. fig. 147; Martens, Von der Decken's Reisen in Ost-Afrika, vol. iii. p. 153.

Melania zanguebarica, Petit, Journ. de Conch. vol. ii. p. 263, pl. 7. f. 1.

Hab. Between Lake Nyassa and the east coast (*Thomson*); Umba (*Craven*); Zanzibar (*Lea*).

The specimen figured in the 'Conchologia Iconica' is small in comparison with those collected by Mr. Thomson, the largest of which, if the apex were complete, would have a length of about 42 millims, and in diameter it is 17. In the original description Lea describes the single shell which was submitted to him as "ferruginea," and does not mention the dark zone round the middle of the body-whorl. This, although very obscure, is visible in the specimen referred to, now in the British Museum. In shells in good condition two other bands are observable within the aperture—one above, close to the suture, and the other near the base. *Melania zanguebarica* of Petit appears to be the same as this species; and *Paludomus africanus* of Martens, if not identical, offers but slight distinctions.

41. Planorbis sudanicus, Martens.

This species was also recorded in my previous paper (Proc. Zool. Soc. 1880, p. 349) on Lake-Tanganyika shells.

42. Segmentina (Planorbula) alexandrina, Ehrenberg, var. tanganyicensis. (Plate XXXIV. figs. 30–30 *b*.)

Shell moderately depressed, equally umbilicated on both sides, obtusely angular at the periphery, distinctly keeled on the top of the whorls, and angulated around the umbilicus, brownish horn-colour, spirally finely striated and more distinctly by the incremental lines. Whorls 5; aperture irregularly lunate. Peristome strengthened within with a whitish rib. Height of largest specimen 4 millims., greatest diameter 12; aperture 4 high, $3\frac{1}{2}$ broad. Another is 10 wide and $3\frac{1}{2}$ high.

Hab. Lake Tanganyika (*Thomson*).

The four shells before me are constant in the characters above given, and might therefore be specifically distinguished from the *P. alexandrina* of Ehrenberg. The normal form of that species has the whorls rounded above, is a trifle flatter, and consequently not

so deeply umbilicated and less acutely carinated around the umbilicus. The teeth, which frequently are present within the aperture of the Egyptian species, do not exist in either of the Tanganyikan specimens; but the character of the rib bordering the peristome is similar in both forms.

43. Limnæa natalensis, Krauss.

Limnæa natalensis, Krauss, Südafrik. Moll. p. 85, pl. 5. f. 15; Küster, Con.-Cab. pl. 6. f. 1–3; Martens, Mal. Blät. 1866, pl. 3. f. 8, 9.

Hab. Lake Tanganyika (*Hore & Thomson*).

This species has a very extensive range, having been recorded from Natal (*Krauss*), Abyssinia (*Blanford* and *Martens*), Lake Nyassa (*Kirk* and *Simons*); and from the west side of the continent at Benguela the same species, apparently, has been described under the name of *L. orophila*.

44. Physa, sp.

Hab. Lake Tanganyika (*Thomson*).

This genus, not previously recorded from this locality, is represented by a single, probably young shell. It is very much of the same character as *P. nyassana*, described in the Proc. Zool. Soc. 1877, p. 717, pl. 75. fig. 16–17. However, it is distinct; for on comparison with a specimen of that species of similar size, it proves to consist of fewer whorls, has a less prominent spire, and narrower umbilicus.

45. Cyrena (Corbicula) radiata, Parreyss, var.?

Cyrena radiata, Parr., Philippi, Abbild. ii. p. 4, pl. i. f. 8; Clessin, Conch.-Cab. (*Corbicula*) pl. 28. f. 16–18.

Hab. Lake Tanganyika (*Thomson*).

The shells from the lake are more finely and closely ribbed than the specimens from the White Nile described by Philippi, and the the hinge is a trifle stouter, but in all other respects agree very well.

The shell figured by Sowerby in a wretched monograph in the 'Conchologia Iconica,' under the name of "*Cyrena radiata*, Hanley, ——? MS." (pl. xi. f. 47 *a*, *b*), is quite distinct from this species; but fig. 47*c* on pl. xiii. may be a bad representation of it.

This species was recorded by me from Lake Nyassa (P. Z. S. 1877, p. 718). On comparing the specimens from that locality with those from Tanganyika it becomes a matter of uncertainty whether they should be regarded conspecific. The shells from the latter lake are longer from the umbo to the ventral margin, and consequently less transversely oblong; their colour is a deeper violet within, whilst the Nyassa specimens are fleshy-brown, varied by the external umbonal and lateral violet rays. Such being the case, I prefer to consider the shells before me as doubtfully belonging to this species, until an opportunity occurs of studying this most difficult genus more thoroughly.

46. Pleiodon spekei, Woodward. (Plate XXXIV. figs. 31, 31*a*.)

Pleiodon spekei, Woodward, Proc. Zool. Soc. 1859, p. 348, pl. 47. f. 2; Smith, P. Z. S. 1880, p. 350; Reeve's Conch. Icon. vol. xvi. f. 2; Küster's Conch.-Cab. (*Iridina*) pl. 70. f. 1.

Hab. Lake Tanganyika (*Thomson*).

Of this fine species the present collection contains two specimens—one quite young, and the other half-grown. The younger shell shows that the teeth on the hinge-line are early developed; and both specimens are broader posteriorly than the adult form and less acuminate at the extremity. The interior of the valves is bluish white, faintly tinged with rose towards the umbones.

47. Mutela exotica, Lamarck.

Mutela exotica, Lamarck, Anim. s. Vert. ed. 2, vol. vi. p. 571; Reeve's Con. Icon. (*Iridina*) fig. 2.

Iridina nilotica (Férussac), Sowerby, Zool. Journ. vol. i. pl. 2; id. Con. Icon. f. 4; Küster, Con.-Cab. pl. 25. f. 3.

Iridina elongata, Sowerby, Genera, fig. 1; id. Conch. Icon. f. 1.

Hab. Lake Tanganyika (*Thomson*).

None of the specimens exceeds 3½ inches in length; and one or two of them are indistinctly wrinkled perpendicularly across the valves a short distance from the umbones.

48. Spatha tanganyicensis, Smith. (Plate XXXIV. fig. 32.)

Spatha tanganyicensis, Smith, Proc. Zool. Soc. 1880, p. 350, pl. 31. figs. 8, 8*a*.

The specimen figured in the above work proves to be an unusually broad form, having the posterior extremity much less acuminate than in what appears to be the most common or typical form of the species. In describing the young shell I suggested that the narrow rostrated form would become modified as the animal increased it, and that the dorsal alation would also enlarge. This surmise is to a great extent upheld by the series of specimens before me. However, the shape remains much more slender than I supposed; but the dorsal wing does increase considerably. The colour of the epidermis varies with age—in young shells generally being yellowish green, and becoming darker or of an olive-brown when more mature. The form of the anterior end is not faithfully described by me or correctly depicted in the figure of the adult shell. The only full-grown specimen then before me was broken at that particular part. The series now at hand shows that the angle formed by the dorsal margin (which slightly descends near the extremity) and the upward sweep of the anterior boundary is much more acute, the latter sometimes being slightly sinuated just below the angle.

49. Unio niloticus, Cailliaud.

This species has been previously recorded from Tanganyika, in my former paper. Several additional specimens show that the form and general colouring of the exterior of examples from this particular

locality vary considerably; however, not one of them takes the form of *U. ægyptiacus* of Férussac, which Jickeli unites with this species. All have the more rhomboidal form and less central umbones of *U. niloticus*; and the epidermis varies from dark olive-brown to yellowish olive or uniform brown. Some of the specimens are indistinctly rayed; and others have a few raised epidermal ridges radiating from the umbones towards the anterior end of the ventral margin. Without exception the valves in front of the umbones are corrugated; but posteriorly there is but rarely any trace of such ornamentation.

50. Unio burtoni, Woodward. (Plate XXXIV. figs. 33–33*b*.)

Unio burtoni, Woodward, Proc. Zool. Soc. 1859, p. 349, pl. 47. fig. 1.

Hab. Tanganyika (*Hore and Thomson*).

The collection brought home by Mr. Thomson contains a series of specimens which I believe are varieties of this species. Not one of them corresponds with the typical form, of which the Museum possesses two examples—one from the Cumingian collection, the other, the type, presented by Capt. Speke. Both these shells are in a considerably worn condition, scarcely a vestige of the epidermis remaining. Their form, too, is more transverse, flatter; and the umbones are less prominent. Among the present series there are two varieties, one much more strongly sculptured than the other. The subgranular character of this ornamentation is somewhat different from that on the typical shells; but some allowance must be made for this, owing to their worn condition. Their outline, too, is no doubt modified to a certain extent from the same cause. The colour of the interior varies from white to uniform rich brownish purple. Both varieties vary in this respect; and intermediate grades of coloration are found in each series. The exterior of the valves also presents difference of colour, in some specimens being of a yellowish tint indistinctly radiated with fine green lines; others are of the same general colour, but lack the green rays; and, again, certain specimens exhibit more of an olivaceous exterior more or less varied with green, the latter consisting of indistinct fine radiating lines.

As a whole, the form of Mr. Thomson's specimens is rather more convex and deeper from the umbo to the ventral margin than that of the two typical specimens; still, as I have previously stated, this in the latter case may be the result of their worn state.

Other specimens, collected by Mr. Hore near Ujiji and recently forwarded to the British Museum by Dr. John Kirk, approach the typical form more closely. The outline varies very much, judging from this series, the position of the umbones also being in some much more forward than in others. The freshest of these, having the epidermis to some extent preserved, shows that the species is ornamented with fine green radiating lines. The amount of sculpture is intermediate between that found on the more rugose variety

collected by Mr. Thomson; and in character it is also intermediate, being less granulose than some, yet hardly agreeing with that of the type specimen. These slight differences are probably modifications produced by difference of locality; for the shells collected by Mr. Thomson were from the southern end of the lake, whilst those obtained by Captain Speke and Mr. Hore were found further north, near Ujiji.

51. Unio nyassaensis, Lea, vars. (Plate XXXIV. figs. 34–34*b*.)

Unio nyassaensis, Lea, Proc. Acad. Nat. Sci. Philad. 1864, p. 108; Journ. Acad. Nat. Sci. Philad. 1866, vol. vi. p. 33, pl. 12. f. 32; Smith, P. Z. S. 1877, p. 719; Sowerby, Conch. Icon. sp. 224, f. *a*, *b* (*U. nyassæ*), Errata and Index (*U. nyassensis*).

Var. = *U. kirkii*, Lea, *l. c.* p. 108; Journal, p. 32, pl. 12. f. 30.

Var. = *U. aferula*, Lea, *l. c.* p. 109; Journal, p. 34, pl. 13. f. 34.

Hab. Lakes Tanganyika and Nyassa (*Thomson.*)

Var. tanganyicensis (fig. 34 *a*).

There are but three valves in Mr. Thomson's collection, which I think may possibly belong to this species. They differ from the normal form in being rather longer transversely, of a pinkish-red colour within, and without also, beneath the greenish epidermis. The latter is finely rayed with green. The sculpture is very similar; but the corrugation does not extend quite so far down the valves.

Var. from Nyassa (fig. 34*b*).

Mr. Thomson's specimens are more triangular than those collected by Dr. Kirk at the same locality, having the hinder extremity considerably produced and pointed. Like the three valves from Lake Tanganyika, they are rather smoother than typical specimens; and some of them are of the same pinkish-red colour. Although, as a rule, very different in form from that figured by Lea, still great allowance has to be made for the great variation that obtains among freshwater genera, and especially in the outline of species of *Unio*; and consequently I prefer to consider the shells in question as varieties of this species rather than distinct forms.

52. Unio tanganyicensis, Smith. (Plate XXXIV. fig. 35.)

Unio tanganyicensis, Smith, Proc. Zool. Soc. 1880, p. 351, pl. 31. f. 9, 9*a*.

As in the case of *U. burtoni*, so also in this species, the specimens now before me differ from the shells described previously. They are less distinctly radiated with green, produced and beaked posteriorly very considerably, and also exhibit a distinct sinuation near the posterior end of the ventral margin. The latter feature, however, exists in some of the typical shells, though in a considerably less degree. They are too, as a rule, narrower from the umbo to the opposite side. The absence of the green lines is to a great extent accounted for by the worn condition of the exterior of most of the specimens; for as soon as the epidermis is removed they vanish with it, being only epidermal markings.